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 **PRINT**

Mark a special word or phrase in this record:

Select one or more organisms in this record:

All organisms	<input type="checkbox"/>
Arabidopsis thaliana	<input type="checkbox"/>
Avena sativa	<input type="checkbox"/>
Cucumis sativus	<input type="checkbox"/>
Pisum sativum	<input type="checkbox"/>

Show additional data

- ☐ Do not include text mining results
 - ☐ Include **AMENDA** (text mining) results^{new!} ([more...](#))
 - ☐ Include **FRENDA** results^{new!} (AMENDA + additional results, but less precise; [more...](#))
- ☐ Please login to have access to the AMENDA and FRENDA data

EC NUMBER COMMENTARY

1.2.3.7

Pathway KEGG Link
Tryptophan metabolism [00380](#)

RECOMMENDED NAME GeneOntology No.
indole-3-acetaldehyde oxidase

SYSTEMATIC NAME
indole-3-acetaldehyde:oxygen oxidoreductase

SYNONYMS	ORGANISM	COMMENTARY	LITERATURE
IAAld oxidase	-	-	-
indoleacetaldehyde oxidase	-	-	-
oxidase, indoleacetaldehyde	-	-	-

CAS REGISTRY NUMBER COMMENTARY
66082-22-2














REACTION	COMMENTARY	ORGANISM	LITERATURE
2 indole-3-acetaldehyde + O ₂ = 2 indole-3-acetate + 2 H ₂ O	-	-	-





REACTION TYPE	ORGANISM	COMMENTARY	LITERATURE
oxidation	-	-	-
redox reaction	-	-	-
reduction	-	-	-

ORGANISM	COMMENTARY	LITERATURE	SEQUENCE CODE	SOURCE
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<u>Arabidopsis thaliana</u>	-	<u>390443</u>	-	BRENDA
<u>Avena sativa</u>	-	<u>390441</u>	-	BRENDA
<u>Cucumis sativus</u>	-	<u>390439</u>	-	BRENDA
<u>Pisum sativum</u>	-	<u>390440</u>	-	BRENDA
<u>Zea mays</u>	-	<u>390442</u>	-	BRENDA

SUBSTRATE	PRODUCT	REACTION DIAGRAM	ORGANISM	COMMENTARY/ Substrate r:=reversible ir:=irreversible	LITERATURE/ Substrate	COMMENTARY/ Product
acetaldehyde + O2	acetate + H2O		<u>Avena sativa</u>	no activity	<u>390441</u>	-
acetaldehyde + O2	acetate + H2O		<u>Pisum sativum</u>	42% of the activity with indole-3-acetaldehyde	<u>390440</u>	-
indole-3-acetaldehyde + O2	indole-3-acetate + H2O		<u>Arabidopsis thaliana</u>	-	<u>390443</u>	-
indole-3-acetaldehyde + O2	indole-3-acetate + H2O		<u>Arabidopsis thaliana</u>	enzyme form AO1 has a possible role in indole-3-acetic acid biosynthesis	<u>390443</u>	-
indole-3-acetaldehyde + O2	indole-3-acetate + H2O		<u>Avena sativa</u>	-	<u>390441</u>	-
indole-3-acetaldehyde + O2	indole-3-acetate + H2O		<u>Avena sativa</u>	terminal step in biogenesis of indole-3-acetic acid	<u>390441</u>	-
indole-3-acetaldehyde + O2	indole-3-acetate + H2O		<u>Cucumis sativus</u>	-	<u>390439</u>	-
indole-3-acetaldehyde + O2	indole-3-acetate + H2O		<u>Pisum sativum</u>	-	<u>390440</u>	-
indole-3-acetaldehyde + O2	indole-3-acetate + H2O		<u>Zea mays</u>	-	<u>390442</u>	-
indole-3-acetaldehyde + phenazine methosulfate	indole-3-acetate + ?		<u>Avena sativa</u>	-	<u>390441</u>	-
indole-3-aldehyde + O2	3-carboxyindole + H2O		<u>Avena sativa</u>	88% of the activity with indole-3-acetaldehyde	<u>390441</u>	-
indole-3-aldehyde + O2	3-carboxyindole + H2O		<u>Pisum sativum</u>	21% of the activity with indole-3-acetaldehyde	<u>390440</u>	-
phenylacetaldehyde + O2	phenylacetate + H2O		<u>Avena sativa</u>	86% of the activity with indole-3-acetaldehyde	<u>390441</u>	-

NATURAL NATURAL REACTION ORGANISM COMMENTARY LITERATURE COMMENTARY LITERATURE (

SUBSTRATES	PRODUCTS	DIAGRAM	SUBSTRATE	(Substrate)	PRODUCT	(Product)	(
indole-3-acetaldehyde + O ₂	indole-3-acetate + H ₂ O		<u>Arabidopsis thaliana</u>	enzyme form AO1 has a possible role in indole-3-acetic acid biosynthesis	<u>390443</u>	-	-
indole-3-acetaldehyde + O ₂	indole-3-acetate + H ₂ O		<u>Avena sativa</u>	terminal step in biogenesis of indole-3-acetic acid	<u>390441</u>	-	-

COFACTOR	ORGANISM	COMMENTARY	LITERATURE	IMAGE
Flavin	<u>Avena sativa</u>	no flavoprotein	<u>390441</u>	● <u>2D-image</u>
Flavin	<u>Cucumis sativus</u>	metalloflavoprotein	<u>390439</u>	● <u>2D-image</u>
Flavin	<u>Pisum sativum</u>	no flavoprotein	<u>390440</u>	● <u>2D-image</u>
Heme	<u>Cucumis sativus</u>	contains a heme type iron component	<u>390439</u>	● <u>2D-image</u>

METALS and IONS	ORGANISM	COMMENTARY	LITERATURE
Iron	<u>Cucumis sativus</u>	contains a heme type iron component	<u>390439</u>
MgCl ₂	<u>Cucumis sativus</u>	1 mM, activates	<u>390439</u>

INHIBITORS	ORGANISM	COMMENTARY	LITERATURE	IMAGE
2,4-Dichlorophenol	<u>Cucumis sativus</u>	-	✓ <u>390439</u>	● <u>2D-image</u>
2,4-Dichlorophenoxyacetic acid	<u>Cucumis sativus</u>	-	<u>390439</u>	● <u>2D-image</u>
2,4-Dinitrophenol	<u>Cucumis sativus</u>	-	<u>390439</u>	● <u>2D-image</u>
2-Mercaptoethanol	<u>Avena sativa</u>	-	<u>390441</u>	● <u>2D-image</u>
Azide	<u>Cucumis sativus</u>	-	<u>390439</u>	● <u>2D-image</u>
Benzaldehyde	<u>Cucumis sativus</u>	-	<u>390439</u>	● <u>2D-image</u>
Cyanide	<u>Avena sativa</u>	-	<u>390441</u>	● <u>2D-image</u>
Cyanide	<u>Pisum sativum</u>	-	<u>390440</u>	● <u>2D-image</u>
Dichlorophenoxyacetic acid	<u>Cucumis sativus</u>	-	<u>390439</u>	● <u>2D-image</u>
Dithionite	<u>Avena sativa</u>	-	<u>390441</u>	● <u>2D-image</u>
EDTA	<u>Cucumis sativus</u>	-	<u>390439</u>	● <u>2D-image</u>
EDTA	<u>Pisum sativum</u>	-	<u>390440</u>	● <u>2D-image</u>
F-	<u>Cucumis sativus</u>	-	<u>390439</u>	● <u>2D-image</u>
H ₂ O ₂	<u>Avena sativa</u>	-	<u>390441</u>	● <u>2D-image</u>
HgCl ₂	<u>Cucumis</u>	-	<u>390439</u>	● <u>2D-</u>

	<u>sativus</u>				image
Hydroxylamine	<u>Pisum sativum</u>	-	390440	● 2D-image	
Indole-3-acetic acid	<u>Cucumis sativus</u>	feedback inhibition in vivo	390439	● 2D-image	
Iodoacetate	<u>Avena sativa</u>	-	390441	● 2D-image	
Iodoacetate	<u>Cucumis sativus</u>	-	390439	● 2D-image	
Menadione	<u>Avena sativa</u>	slight	390441	● 2D-image	
More	<u>Pisum sativum</u>	not: p-phenanthroline, diethyldithiocarbamate, xanthogenate, semicarbazide	390440	-	
N-Ethylmaleimide	<u>Cucumis sativus</u>	-	390439	● 2D-image	
N-Ethylmaleimide	<u>Pisum sativum</u>	-	390440	● 2D-image	
p-Hydroxymercuribenzoate	<u>Pisum sativum</u>	-	390440	● 2D-image	
p-Nitrophenol	<u>Cucumis sativus</u>	-	390439	● 2D-image	
Phenylacetaldehyde	<u>Cucumis sativus</u>	-	390439	● 2D-image	

ACTIVATING COMPOUND ORGANISM COMMENTARY LITERATURE IMAGE

2-Mercaptoethanol Cucumis sativus activates [390439](#) ● [2D-image](#)

KM VALUE [mM]	KM VALUE [mM] Maximum	SUBSTRATE	ORGANISM	COMMENTARY	LITERATURE	IMAGE
0.345	-	Indole-3-acetaldehyde	<u>Avena sativa</u>	-	390441	● 2D-image
1.4	-	Indole-3-acetaldehyde	<u>Pisum sativum</u>	-	390440	● 2D-image

Ki VALUE [mM] Ki VALUE [mM] Maximum INHIBITOR ORGANISM COMMENTARY LITERATURE IMAGE

No entries in this field

TURNOVER NUMBER[1/s] TURNOVER NUMBER MAXIMUM[1/s] SUBSTRATE ORGANISM COMMENTARY LITERATURE IMAGE

No entries in this field

SPECIFIC ACTIVITY [μmol/min/mg] SPECIFIC ACTIVITY MAXIMUM ORGANISM COMMENTARY LITERATURE

additional information - Pisum sativum - [390440](#)

pH OPTIMUM pH MAXIMUM ORGANISM COMMENTARY LITERATURE

8 - Pisum sativum - [390440](#)
 6.2 - Cucumis sativus crude extract [390439](#)
 4.4 - Avena sativa - [390441](#)

pH RANGE	pH RANGE MAXIMUM	ORGANISM	COMMENTARY	LITERATURE
5.8	6.8	<u>Cucumis sativus</u>	pH 5.8: about 40% of maximal activity, pH 6.8: about 25% of maximal activity, crude extract	<u>390439</u>
2.9	5.5	<u>Avena sativa</u>	about 50% of maximal activity at pH 2.9 and at pH 5.5	<u>390441</u>

TEMPERATURE OPTIMUM	TEMPERATURE OPTIMUM MAXIMUM	ORGANISM	COMMENTARY	LITERATURE
60	70	<u>Zea mays</u>	-	<u>390442</u>

TEMPERATURE RANGE	TEMPERATURE MAXIMUM	ORGANISM	COMMENTARY	LITERATURE
50	80	<u>Zea mays</u>	50°C: about 50% of maximal activity, 80°C: about 70% of maximal activity	<u>390442</u>

SOURCE TISSUE	ORGANISM	COMMENTARY	LITERATURE	SOURCE
coleoptile	<u>Avena sativa</u>	-	<u>390441</u>	BRENDA
coleoptile	<u>Zea mays</u>	-	<u>390442</u>	BRENDA
epicotyl	<u>Pisum sativum</u>	-	<u>390440</u>	BRENDA
seed	<u>Avena sativa</u>	-	<u>390441</u>	BRENDA
seedling	<u>Arabidopsis thaliana</u>	activity is higher in sur1 mutant seedlings than in wild-type	<u>390443</u>	BRENDA
seedling	<u>Cucumis sativus</u>	-	<u>390439</u>	BRENDA
seedling	<u>Pisum sativum</u>	-	<u>390440</u>	BRENDA

LOCALIZATION ORGANISM COMMENTARY GeneOntology No. LITERATURE SOURCE

No entries in this field

ACCESSION CODE ENTRY NAME ORGANISM NO. OF AA MOLECULAR WEIGHT[Da] SOURCE Sequence

No entries in this field

PDB ORGANISM

No entries in this field

MOLECULAR WEIGHT MOLECULAR WEIGHT MAXIMUM ORGANISM COMMENTARY LITERATURE

No entries in this field

SUBUNITS ORGANISM COMMENTARY LITERATURE

No entries in this field

POSTTRANSLATIONAL MODIFICATION ORGANISM COMMENTARY LITERATURE

No entries in this field

Crystallization/COMMENTARY ORGANISM LITERATURE

No entries in this field

pH STABILITY pH STABILITY MAXIMUM ORGANISM COMMENTARY LITERATURE

6 9 Pisum sativum 4°C, 18 h, stable 390440

TEMPERATURE STABILITY	TEMPERATURE STABILITY MAXIMUM	ORGANISM	COMMENTARY	LITERATURE
40	-	<u>Pisum sativum</u>	10 min, 41% loss of activity	<u>390440</u>
0	30	<u>Pisum sativum</u>	10 min, stable	<u>390440</u>
additional information	-	<u>Pisum sativum</u>	activated by heating at 60°C, about 2 min	<u>390440</u>

GENERAL STABILITY ORGANISM LITERATURE
prolonged dialysis inactivates Avena sativa 390441

ORGANIC SOLVENT ORGANISM COMMENTARY LITERATURE
No entries in this field

OXIDATION STABILITY ORGANISM LITERATURE
No entries in this field

STORAGE STABILITY ORGANISM LITERATURE
No entries in this field

Purification/COMMENTARY ORGANISM LITERATURE
partial Pisum sativum 390440
partial Avena sativa 390441

Cloned/COMMENTARY ORGANISM LITERATURE
No entries in this field

ENGINEERING ORGANISM COMMENTARY LITERATURE
No entries in this field

Renatured/COMMENTARY ORGANISM LITERATURE
No entries in this field

APPLICATION ORGANISM COMMENTARY LITERATURE
No entries in this field

DISEASE TITLE OF PUBLICATION LINK TO PUBMED
No entries in this field

REF.	AUTHORS	TITLE	JOURNAL	VOL.	PAGES	YEAR	ORGANISM	LINK TO PUBMED	SOURCE
★ 390439	Bower, P.J.; Brown, H.M.; Purves, W.K.	Cucumber Seedling Indoleacetaldehyde Oxidase.	Plant Physiol.	61	107- 110	1978	Cucumis sativus	● PubMed	BRENDA
390440	Miyata, S.;	Indole-3-acetyldehyde	Physiol.	51	402-	1981	Pisum	-	

	Suzuki, Y.; Kamisaka, S.; Masuda, Y.	oxidase of pea seedlings	Plant.	406			sativum		BRENDA
390441	Rajagopal, R.	Metabolism of indole-3- acetaldehyde. III. Some characteristics of the aldehyde oxidase of Avena coleoptiles	Physiol. Plant.	24	272- 281	1971	Avena sativa	-	BRENDA
★ 390442	Koshiba, T.; Matsuyama, H.	An in vitro system of indole-3-acetic acid formation from tryptophan in maize (Zea mays) coleoptile extracts	Plant Physiol.	102	1319- 1324	1993	Zea mays	● PubMed	BRENDA
390443	Seo, M.; Akaba, S.; Oritani, T.; Delarue, M.; Bellini, C.; Caboche, M.; Koshiba, T.	Higher activity of an aldehyde oxidase in the auxin- overproducing superroot1 mutant of Arabidopsis thaliana	Plant Physiol.	116	687- 693.	1998	Arabidopsis thaliana	● PubMed	BRENDA

LINKS TO OTHER DATABASES (specific for EC-Number 1.2.3.7)

[ExPASy](#)

[KEGG](#)

NCBI: [PubMed](#), [Protein](#), [Nucleotide](#), [Structure](#), [Genome](#), [OMIM](#), [Domains](#)

[IUBMB Enzyme Nomenclature](#)

[PDB database\(3D structure\)](#)

[PROSITE Database of protein families and domains](#)

SYSTEMS

[Protein Mutant Database](#)

[Structural Classification of Proteins \(SCOP\)](#)

[Protein Structure Classification \(CATH\)](#)

[InterPro \(database of protein families, domains and functional sites\)](#)

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Mark a special word or phrase in this record:

 Mark!

Select one or more organisms in this record:

All organisms	
Bacterium	
Candida maltosa	
Clostridium sporogenes	
Enterobacter cloacae	

Submit
Show additional data

- ☐ Do not include text mining results
- ☐ Include **AMENDA** (text mining) results^{new!} ([more...](#))
- ☐ Include **FRENDA** results^{new!} (AMENDA + additional results, but less precise; [more...](#))

 Please login to have access to the AMENDA and FRENDA data**EC NUMBER COMMENTARY****2.6.1.27**

Pathway KEGG Link
 Tryptophan metabolism [00380](#)

RECOMMENDED NAME GeneOntology No.
 tryptophan transaminase

SYSTEMATIC NAME
 L-tryptophan:2-oxoglutarate aminotransferase

SYNONYMS

5-hydroxytryptophan-ketoglutaric transaminase
 aminotransferase, tryptophan
 hydroxytryptophan aminotransferase
 L-phenylalanine-2-oxoglutarate aminotransferase
 L-tryptophan aminotransferase
 L-tryptophan transaminase
 tryptophan aminotransferase

ORGANISM COMMENTARY LITERATURE

-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

CAS REGISTRY NUMBER COMMENTARY

9022-98-4

REACTION

L-tryptophan + 2-oxoglutarate = (indol-3-yl)pyruvate + L-glutamate

**COMMENTARY**












also acts on 5-hydroxytryptophan and, to a lesser extent, on the phenyl amino acids





















ORGANISM LITERATURE















REACTION TYPE ORGANISM COMMENTARY LITERATURE




amino group transfer

ORGANISM	COMMENTARY	LITERATURE	SEQUENCE CODE	SOURCE
Bacterium	-	639942	-	BRENDA
<u>Candida maltosa</u>	-	639943	-	BRENDA
<u>Clostridium sporogenes</u>	-	639939	-	BRENDA
Phaseolus aureus	-	639947	-	BRENDA
<u>Rattus norvegicus</u>	-	639944 , 639946	-	BRENDA
<u>Rhodospiridium toruloides</u>	-	639945	-	BRENDA ^p
<u>Streptomyces griseus</u>	-	441312	-	BRENDA
<u>Sus scrofa</u>	-	639938	-	BRENDA
<u>Zea mays</u>	-	639941	-	BRENDA

SUBSTRATE	PRODUCT	REACTION DIAGRAM	ORGANISM	COMMENTARY/ Substrate r:=reversible ir:=irreversible	LITERATURE/ Substrate	CC Pr
3-methyltryptophan + 2-oxoglutarate	3-(3-methylindole)-2-oxopropanoate + L-glutamate		<u>Streptomyces griseus</u>	can also inhibit the enzyme, stereospecific for positions 2 and 3	441312	
5-hydroxytryptophan + 2-oxoglutarate	3-(5-hydroxyindole)-2-oxopropanoate + L-glutamate		<u>Rattus norvegicus</u>	-	639946	
5-hydroxytryptophan + 2-oxoglutarate	3-(5-hydroxyindole)-2-oxopropanoate + L-glutamate		<u>Sus scrofa</u>	DL-5-hydroxytryptophan, 62% as effective as L-phenylalanine	639938	
5-hydroxytryptophan + oxaloacetate	3-(5-hydroxyindole)-2-oxopropanoate + L-aspartate		<u>Rattus norvegicus</u>	-	639946	
D-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		<u>Rhodospiridium toruloides</u>	activity can be due to a different enzyme	639945	
D-tryptophan + pyruvate	3-indole-2-oxopropanoate + L-alanine		<u>Zea mays</u>	D-TAT	639941	
D-tryptophan + pyruvate	3-indole-2-oxopropanoate + L-alanine		<u>Zea mays</u>	no activity with oxaloacetate and 2-oxoglutarate as amino group acceptors	639941	
DL-p-fluorophenylalanine + 2-oxoglutarate	3-(4-fluorophenyl)-2-oxopropanoate + L-glutamate		<u>Sus scrofa</u>	41% as effective as phenylalanine	639938	
L-3,4-dihydroxyphenylalanine + 2-oxoglutarate	3-(3,4-dihydroxyphenyl)-2-oxopropanoate + L-glutamate		<u>Sus scrofa</u>	46% as effective as L-phenylalanine	639938	
L-aspartate + 2-oxoglutarate	oxaloacetate + L-glutamate		<u>Rattus norvegicus</u>	-	639946	
L-aspartate + oxaloacetate	oxaloacetate + L-aspartate		<u>Rattus norvegicus</u>	-	639946	
L-aspartate +	2-oxosuccinic acid + L-		<u>Sus scrofa</u>	10% as effective	639938	

phenylpyruvate	phenylalanine			as L-glutamate		
L-histidine + 2-oxoglutarate	3-(1H-imidazol-4-yl)-2-oxopropanoate + L-glutamate		<u>Sus scrofa</u>	35% as effective as L-phenylalanine	<u>639938</u>	
L-phenylalanine + 2-oxoglutarate	L-glutamate + phenylpyruvate		<u>Clostridium sporogenes</u>	-	<u>639939</u>	
L-phenylalanine + 2-oxoglutarate	L-glutamate + phenylpyruvate		<u>Rattus norvegicus</u>	-	<u>639946</u>	
L-phenylalanine + 2-oxoglutarate	L-glutamate + phenylpyruvate		<u>Streptomyces griseus</u>	-	<u>441312</u>	
L-phenylalanine + 2-oxoglutarate	L-glutamate + phenylpyruvate		<u>Sus scrofa</u>	-	<u>639938</u>	
L-phenylalanine + 2-oxosuccinic acid	phenylpyruvate + L-aspartate		<u>Sus scrofa</u>	70% as effective as 2-oxoglutarate	<u>639938</u>	
L-phenylalanine + oxaloacetate	phenylpyruvate + L-aspartate		<u>Rattus norvegicus</u>	-	<u>639946</u>	
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		Bacterium	role in microbial synthesis of auxins, influence on plant growth and development	<u>639942</u>	
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		Bacterium	specific for the substrates	<u>639942</u>	i.e. pyr
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		<u>Candida maltosa</u>	-	<u>639943</u>	
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		<u>Clostridium sporogenes</u>	-	<u>639939</u>	
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		<u>Clostridium sporogenes</u>	first step in metabolic path for the conversion of L-tryptophan to indolepropionate	<u>639939</u>	
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		<u>Phaseolus aureus</u>	-	<u>639947</u>	i.e. pyr
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		<u>Rattus norvegicus</u>	-	<u>639944</u>	
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		<u>Rattus norvegicus</u>	-	<u>639946</u>	
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		<u>Rhodospiridium toruloides</u>	-	<u>639945</u>	
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		<u>Streptomyces griseus</u>	-	<u>441312</u>	
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		<u>Streptomyces griseus</u>	initial step of biosynthetic pathway of the antibiotic indolmycin	<u>441312</u>	
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		<u>Sus scrofa</u>	52% of the activity with L-phenylalanine	<u>639938</u>	
L-tryptophan + 2-	L-glutamate + 3-indole-		<u>Zea mays</u>	2-oxoglutarate is	<u>639941</u>	

oxoglutarate	2-oxopropanoate			more effective than pyruvate, oxaloacetate and glyoxylate	
L-tryptophan + glyoxylate	3-indole-2-oxopropanoate + glycine		<u>Zea mays</u>	isozymes L-TAT-1 and L-TAT-2	<u>639941</u>
L-tryptophan + oxaloacetate	3-indole-2-oxopropanoate + L-aspartate		<u>Rattus norvegicus</u>	-	<u>639946</u>
L-tryptophan + oxaloacetate	3-indole-2-oxopropanoate + L-aspartate		<u>Zea mays</u>	isozymes L-TAT-1 and L-TAT-2	<u>639941</u>
L-tyrosine + 2-oxoglutarate	L-glutamate + 3-(4-hydroxyphenyl)-2-oxopropanoate		<u>Clostridium sporogenes</u>	-	<u>639939</u>
L-tyrosine + 2-oxoglutarate	L-glutamate + 3-(4-hydroxyphenyl)-2-oxopropanoate		<u>Rattus norvegicus</u>	-	<u>639946</u>
L-tyrosine + 2-oxoglutarate	L-glutamate + 3-(4-hydroxyphenyl)-2-oxopropanoate		<u>Streptomyces griseus</u>	-	<u>441312</u>
L-tyrosine + 2-oxoglutarate	L-glutamate + 3-(4-hydroxyphenyl)-2-oxopropanoate		<u>Sus scrofa</u>	49% of the activity with L-phenylalanine	<u>639938</u>
L-tyrosine + oxaloacetate	3-(4-hydroxyphenyl)-2-oxopropanoate + L-aspartate		<u>Rattus norvegicus</u>	-	<u>639946</u>
More	?		<u>Candida maltosa</u>	substrate specificity	<u>639943</u>
More	?		Phaseolus aureus	substrate specificity	<u>639947</u>
More	?		<u>Streptomyces griseus</u>	no activity with D-tryptophan	<u>441312</u>
More	?		<u>Sus scrofa</u>	no activity with D-phenylalanine and D-glutamic acid	<u>639938</u>
More	?		<u>Sus scrofa</u>	substrate specificity	<u>639938</u>

NATURAL SUBSTRATES	NATURAL PRODUCTS	REACTION DIAGRAM	ORGANISM	COMMENTARY SUBSTRATE	LITERATURE (Substrate)	COMMENTARY PRODUCT	LITERATURE (Product)
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		<u>Clostridium sporogenes</u>	first step in metabolic path for the conversion of L-tryptophan to indolepropionate	<u>639939</u>	-	-
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		<u>Streptomyces griseus</u>	initial step of biosynthetic pathway of the antibiotic indolmycin	<u>441312</u>	-	-
L-tryptophan + 2-oxoglutarate	L-glutamate + 3-indole-2-oxopropanoate		Bacterium	role in microbial synthesis of auxins,	<u>639942</u>	-	-

influence on
plant growth and
development

COFACTOR	ORGANISM	COMMENTARY	LITERATURE	IMAGE
Pyridoxal 5'-phosphate	Bacterium	-	639942	● 2D-image
Pyridoxal 5'-phosphate	Clostridium sporogenes	Km: 0.00218 mM; required for full activation	639939	● 2D-image
Pyridoxal 5'-phosphate	Streptomyces griseus	-	441312	● 2D-image
Pyridoxal 5'-phosphate	Sus scrofa	pyridoxamine 5'-phosphate and pyridoxal phosphate are effective in partially restoring the apoenzyme activity and in stimulating the holoenzyme pyridoxamine phosphate, pyridoxamine phosphate is somewhat more effective than pyridoxal phosphate	639938	● 2D-image
Pyridoxal 5'-phosphate	Zea mays	required for full activation	639941	● 2D-image
Pyridoxamine 5'-phosphate	Clostridium sporogenes	activates	639939	● 2D-image
Pyridoxamine 5'-phosphate	Sus scrofa	pyridoxamine 5'-phosphate and pyridoxal phosphate are effective in partially restoring the apoenzyme activity and in stimulating the holoenzyme pyridoxamine phosphate, pyridoxamine phosphate is somewhat more effective than pyridoxal phosphate	639938	● 2D-image

METALS and IONS ORGANISM COMMENTARY LITERATURE

No entries in this field

INHIBITORS	ORGANISM	COMMENTARY	LITERATURE	IMAGE
3-Methyltryptophan	Streptomyces griseus	can also act as substrate	441312	● 2D-image
4-Fluorophenylalanine	Sus scrofa	32 mM, 50% inhibition	639938	● 2D-image
L-Glutamate	Rattus norvegicus	inhibits activity towards tryptophan	639946	● 2D-image
More	Rattus norvegicus	-	639944	-
More	Sus scrofa	reduced activity in cacodylate, Tris and borate buffers; not affected by metal chelators and high concentration of ammonium sulfate	639938	-
p-Chloromercuribenzoate	Streptomyces griseus	no inhibition	441312	● 2D-image
p-Chloromercuribenzoate	Sus scrofa	reduced by preincubation with L-phenylalanine and pyridoxal phosphate and reversed by a subsequent preincubation with 2-mercaptoethanol	639938	● 2D-image

ACTIVATING COMPOUND	ORGANISM	COMMENTARY	LITERATURE	IMAGE
2-Mercaptoethanol	Sus scrofa	preincubation, activates	639938	● 2D-image
More	Clostridium sporogenes	high salt concentrations activate; no activation by: pyridoxine, pyridoxal, pyridoxamine	639939	-
More	Rhodosporidium	-	639945	-

		<u>toruloides</u>				
More		<u>Sus scrofa</u>	no activation by: pyridoxine, pyridoxal, pyridoxamine		<u>639938</u>	-
Phosphate		<u>Sus scrofa</u>	maximal activity in presence of phosphate buffer, in absence reaction proceeds at 50% of that observed in optimal phosphate concentration		<u>639938</u>	● <u>2D-image</u>
KM VALUE [mM]	KM VALUE [mM] Maximum	SUBSTRATE	ORGANISM	COMMENTARY	LITERATURE	IMAGE
0.158	-	2-Oxoglutarate	<u>Clostridium sporogenes</u>	cosubstrate phenylalanine , pH 8.4, 22°C approximately	<u>639939</u>	● <u>2D-image</u>
0.74	-	2-Oxoglutarate	<u>Sus scrofa</u>	cosubstrate phenylalanine, pH 8.0, 37°C	<u>639938</u>	● <u>2D-image</u>
7	-	4-Fluorophenylalanine	<u>Sus scrofa</u>	pH 8.0, 37°C	<u>639938</u>	● <u>2D-image</u>
6	-	L-3,4-Dihydroxyphenylalanine	<u>Sus scrofa</u>	pH 8.0, 37°C	<u>639938</u>	● <u>2D-image</u>
50	-	L-Phenylalanine	<u>Sus scrofa</u>	pH 8.0, 37°C	<u>639938</u>	● <u>2D-image</u>
1.22	-	L-Tryptophan	Bacterium	pH 8.0, 40°C	<u>639942</u>	● <u>2D-image</u>
2.68	-	L-Tryptophan	<u>Clostridium sporogenes</u>	cosubstrate tryptophan, pH 8.4, 22°C approximately	<u>639939</u>	● <u>2D-image</u>
15	-	L-Tryptophan	<u>Sus scrofa</u>	pH 8.0, 37°C	<u>639938</u>	● <u>2D-image</u>
3.8	-	L-Tyrosine	<u>Sus scrofa</u>	pH 8.0, 37°C	<u>639938</u>	● <u>2D-image</u>
additional information	-	More	<u>Candida maltosa</u>	-	<u>639943</u>	-
additional information	-	More	Phaseolus aureus	-	<u>639947</u>	-
additional information	-	More	<u>Rattus norvegicus</u>	-	<u>639944</u>	-

Ki VALUE [mM] Ki VALUE [mM] Maximum INHIBITOR ORGANISM COMMENTARY LITERATURE IMAGE

No entries in this field

TURNOVER NUMBER[1/s] TURNOVER NUMBER MAXIMUM[1/s] SUBSTRATE ORGANISM COMMENTARY LITERATURE IMAGE

No entries in this field

SPECIFIC ACTIVITY [μmol/min/mg]	SPECIFIC ACTIVITY MAXIMUM	ORGANISM	COMMENTARY	LITERATURE
23.6	-	<u>Clostridium sporogenes</u>	partially purified enzyme	<u>639939</u>
7.04	-	<u>Sus scrofa</u>	reverse reaction, purified enzyme	<u>639938</u>

pH OPTIMUM pH MAXIMUM ORGANISM COMMENTARY LITERATURE

8.4	-	<u>Clostridium sporogenes</u>	-	<u>639939</u>
8	-	Bacterium	-	<u>639942</u>
8	-	<u>Rattus norvegicus</u>	-	<u>639946</u>
8	-	<u>Sus scrofa</u>	assay at	<u>639938</u>
8	9	<u>Sus scrofa</u>	phenylalanine	<u>639938</u>
8	9	<u>Zea mays</u>	both L-TAT isozymes, D-TAT	<u>639941</u>

pH RANGE	pH RANGE MAXIMUM	ORGANISM	COMMENTARY	LITERATURE
7	9.3	<u>Clostridium sporogenes</u>	pH 7.0: about 55% of activity maximum, pH 9.3: about 60% of activity maximum	<u>639939</u>

TEMPERATURE OPTIMUM	TEMPERATURE OPTIMUM MAXIMUM	ORGANISM	COMMENTARY	LITERATURE
50	60	<u>Zea mays</u>	both L-TAT isozymes	<u>639941</u>
40	-	Bacterium	-	<u>639942</u>
37	-	<u>Sus scrofa</u>	assay at	<u>639938</u>
30	-	<u>Zea mays</u>	D-TAT	<u>639941</u>
22	-	<u>Clostridium sporogenes</u>	assay at	<u>639939</u>

TEMPERATURE RANGE TEMPERATURE MAXIMUM ORGANISM COMMENTARY LITERATURE

No entries in this field

SOURCE TISSUE	ORGANISM	COMMENTARY	LITERATURE	SOURCE
brain	<u>Rattus norvegicus</u>	-	<u>639946</u>	BRENDA
brain	<u>Sus scrofa</u>	cortex	<u>639938</u>	BRENDA
brain cortex	<u>Sus scrofa</u>	-	<u>639938</u>	BRENDA
coleoptile	<u>Zea mays</u>	-	<u>639941</u>	BRENDA
leaf	Phaseolus aureus	-	<u>639947</u>	BRENDA
liver	<u>Rattus norvegicus</u>	-	<u>639944</u>	BRENDA
root	Phaseolus aureus	-	<u>639947</u>	BRENDA
seedling	Phaseolus aureus	-	<u>639947</u>	BRENDA

LOCALIZATION	ORGANISM	COMMENTARY	GeneOntology No.	LITERATURE	SOURCE
cytosol	Phaseolus aureus	-	-	<u>639947</u>	BRENDA
cytosol	<u>Rattus norvegicus</u>	-	-	<u>639944</u>	BRENDA
cytosol	<u>Rattus norvegicus</u>	also synaptosomal cytosol	-	<u>639946</u>	BRENDA
more	<u>Rattus norvegicus</u>	no activity in mitochondria	-	<u>639946</u>	BRENDA
particle-bound	<u>Rhodospiridium toruloides</u>	no success in solubilization of the enzyme from the particles	-	<u>639945</u>	BRENDA
synaptosome	<u>Rattus norvegicus</u>	cytosol	-	<u>639946</u>	BRENDA

ACCESSION CODE ENTRY NAME ORGANISM NO. OF AA MOLECULAR WEIGHT[Da] SOURCE Sequence

No entries in this field

PDB ORGANISM

No entries in this field

MOLECULAR WEIGHT	MOLECULAR WEIGHT MAXIMUM	ORGANISM	COMMENTARY	LITERATURE
97000	-	<u>Clostridium sporogenes</u>	sucrose density gradient centrifugation	<u>639939</u>
80000	-	<u>Zea mays</u>	isozyme form L-TAT-1, gel filtration	<u>639941</u>
55000	-	<u>Rattus norvegicus</u>	-	<u>639946</u>
55000	-	<u>Zea mays</u>	D-TAT, gel filtration	<u>639941</u>
45000	-	<u>Zea mays</u>	isozyme form L-TAT-2, gel filtration	<u>639941</u>

SUBUNITS ORGANISM COMMENTARY LITERATURE

No entries in this field

POSTTRANSLATIONAL MODIFICATION ORGANISM COMMENTARY LITERATURE

No entries in this field

Crystallization/COMMENTARY ORGANISM LITERATURE

No entries in this field

pH STABILITY pH STABILITY MAXIMUM ORGANISM COMMENTARY LITERATURE

No entries in this field

TEMPERATURE STABILITY	TEMPERATURE STABILITY MAXIMUM	ORGANISM	COMMENTARY	LITERATURE
0	10	<u>Streptomyces griseus</u>	12 h, complete loss of activity	<u>441312</u>

GENERAL STABILITY ORGANISM LITERATURElow buffer concentrations: loss of activity Clostridium sporogenes 639939unstable upon freezing and thawing Clostridium sporogenes 639939**ORGANIC SOLVENT ORGANISM COMMENTARY LITERATURE**

No entries in this field

OXIDATION STABILITY ORGANISM LITERATURE

No entries in this field

STORAGE STABILITY	ORGANISM	LITERATURE
-20°C, 0.40 M potassium phosphate buffer, pH 8.0, highly purified enzyme stable for at least 2 weeks	<u>Sus scrofa</u>	<u>639938</u>
-20°C, 100fold purified enzyme, 0.4 M potassium phosphate, pH 8.0, stable for at least 9 months	<u>Sus scrofa</u>	<u>639938</u>
-20°C, best stored by freezing the crude cell-free extract with 10% glycerol or by	<u>Streptomyces</u>	<u>441312</u>

freezing the 45-60% ammonium sulfate precipitate in a phosphate buffer solution griseus
 0°C, partially purified enzyme, stable for at least 48 h Clostridium sporogenes **639939**

Purification/COMMENTARY	ORGANISM	LITERATURE
28fold	<u>Rattus norvegicus</u>	639946
35fold	Phaseolus aureus	639947
about 900fold	Bacterium	639942
partial, 2 isozymes: L-TAT-1 and L-TAT-2, 1 D-tryptophan aminotransferase D-TAT	<u>Sus scrofa</u>	639938
	<u>Zea mays</u>	639941
partial, 200fold	<u>Clostridium sporogenes</u>	639939
partial, 3fold	<u>Streptomyces griseus</u>	441312

Cloned/COMMENTARY ORGANISM LITERATURE

No entries in this field

ENGINEERING ORGANISM COMMENTARY LITERATURE

No entries in this field

Renatured/COMMENTARY ORGANISM LITERATURE

No entries in this field

APPLICATION ORGANISM COMMENTARY LITERATURE

No entries in this field

DISEASE TITLE OF PUBLICATION LINK TO PUBMED

No entries in this field

REF.	AUTHORS	TITLE	JOURNAL	VOL.	PAGES	YEAR	ORGANISM	LINK TO PUBMED	SOURCE
441312	Speedie, M.K.; Hornemann, U.; Floss, H.G.	Isolation and characterization of tryptophan transaminase and indolepyruvate C- methyltransferase. Enzymes involved in indolmycin biosynthesis in Streptomyces griseus	J. Biol. Chem.	250	7819- 7825	1975	Streptomyces griseus	● PubMed	BRENDA
639938	George, H.; Gabay, S.	Brain aromatic aminotransferase. I. Purification and some properties of pig brain L- phenylalanine-2- oxoglutarate aminotransferase	Biochim. Biophys. Acta	167	555- 566	1968	Sus scrofa	● PubMed	BRENDA
639939	O'Neil, S.R.;	Tryptophan	Arch. Biochem.	127	361-	1968	Clostridium	● PubMed	

	DeMoss, R.D.	transaminase from <i>Clostridium sporogenes</i>	Biophys.	369			sporogenes		BRENDA
639941	Koshiba, T.; Mito, N.; Miyakado, M.	L- And D-tryptophan aminotransferases from maize coleoptiles	J. Plant Res.	106	25-29	1993	Zea mays	-	BRENDA
639942	Frankenberger, W.T.Jr.; Poth, M.	L-Tryptophan transaminase of a bacterium isolated from the rhizosphere of <i>Festuca octoflora</i> (Graminae)	Soil Biol. Biochem.	20	299-304	1988	Bacterium	-	BRENDA
639943	Bode, R.; Birnbaum, D.	Characterization of three tryptophan aminotransferases from <i>Candida maltosa</i>	Prog. Tryptophan Serotonin Res. Proc.-Meet. Int. Study Group Tryptophan Res. ISTRY (Schlossberger, H.G., ed.) 4th, Meeting Date 1983, de Gruyter	Berlin	769-772	1984	<i>Candida maltosa</i>	-	BRENDA
639944	Stanley, J.; Nicholas, A.; Thompson, I.; Pogson, C.	Tryptophan aminotransferase activity in rat liver	Prog. Tryptophan Serotonin Res., Proc.-Meet. Int. Study Group Tryptophan Res. ISTRY (Schlossberger, H.G., ed.) 4th, Meeting Date 1983, de Gruyter	Berlin	665-668	1984	<i>Rattus norvegicus</i>	-	BRENDA
639945	Lesch, T.; Bode, R.; Birnbaum, D.	Transamination of L- and D-tryptophan by a soluble and a particle-bound enzyme fraction of <i>Rhodospiridium toruloides</i>	Biochem. Physiol. Pflanz.	174	546-554	1979	<i>Rhodospiridium toruloides</i>	-	BRENDA
639946	Minatogawa, Y.; Noguchi, T.; Kido, R.	Purification, characterization and identification of tryptophan aminotransferase from rat brain.	J. Neurochem.	27	1097-1101	1976	<i>Rattus norvegicus</i>	● PubMed	BRENDA
639947	Truelsen, T.A.	Indole-3-pyruvic acid as an intermediate in the conversion of tryptophan to indole-3-acetic acid. I. Characterization of tryptophan transaminase	Physiol. Plant.	26	289-295	1972	<i>Phaseolus aureus</i>	-	BRENDA

from mung bean
seedlings

LINKS TO OTHER DATABASES (specific for EC-Number 2.6.1.27)

ExPASy

KEGG

NCBI: [PubMed](#), [Protein](#), [Nucleotide](#), [Structure](#), [Genome](#), [OMIM](#), [Domains](#)

[IUBMB Enzyme Nomenclature](#)

[PDB database\(3D structure\)](#)

[PROSITE Database of protein families and domains](#)

SYSTEMS

[Protein Mutant Database](#)

[Structural Classification of Proteins \(SCOP\)](#)

[Protein Structure Classification \(CATH\)](#)

[InterPro \(database of protein families, domains and functional sites\)](#)